



# Nutritional status of diabetic patients attending Sir Sunderlal Hospital, B.H.U. Varanasi (2000-2014): An interventional study

■ SUKANYA CHAKRAVORTY, N.K. AGRAWAL AND ARCHANA CHAKRAVARTY

See end of the paper for authors' affiliation

**Correspondence to :**  
SUKANYA CHAKRAVORTY  
Department of Home Science  
(Food and Nutrition) Mahila  
Maha Vidhyalaya, Banaras  
Hindu University, VARANASI  
(U.P.) INDIA  
Email: [su.chakravorty@gmail.com](mailto:su.chakravorty@gmail.com)

**ABSTRACT :** Diabetic patients encounter several difficulties in complying with the dietary regime. They express feelings of dietary deprivation and rigid dietary control is perceived as the only way to a proper diet and weight management. The main aim of the study is to know the impact of counseling on anthropometry, biochemical values and dietary intake of diabetic patients. The present paper is a compilation of studies carried out on diabetic patients from year 2000 to 2014. The result shows the prevalence rate, BMI, nutrient consumption pattern and blood values (Fasting and post prandial sugar level) of pre and posts diet counseling. The main objectives of the studies carried out in different years were to assess the impact of diet counseling on the blood values and BMI of the studied diabetic patients. All the studies were carried out on patients attending OPD of Endocrinology Department Sir Sunderlal Hospital Varanasi. Samples were selected purposively. The pre- tested questionnaires were used to assess their nutritional status. The 24 hour diet recall method was used to assess their dietary intake. Patients of all the year were based on diet and drug. Based on the studies of all the survey it can be concluded that from year 2000 to 2014 there has been a significant change in the food intake of diabetic patients. According to their weight a difference in BMI was observed. Blood value of patients has also changed due to effect of diet and BMI.

## KEY WORDS :

Diabetes, Nutritional  
Status, BMI, Diet,  
Drug

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Type 2 diabetes is a difficult metabolic problem. It is a national embarrassment that maximum percentage of Indian people are diabetic specially type 2 diabetic. The importance of preventing type 2 diabetic is highlighted by the substantial increase in the prevalence of diabetes in recent year. Genetic susceptibility appears to play a powerful role in the occurrence of type 2 diabetes. Lifestyle modification is a major leading course for type 2 diabetes, which causes obesity and

overweight among the people.

Diabetic patients encounter several difficulties in complying with the dietary regime. They exhibit restrictive eating behaviours, they express feeling of dietary deprivation and rigid dietary control is perceived as the only way to a proper diet and weight management. The main aim of the study is to know the impact of counseling on anthropometry, biochemical values and dietary intake of diabetic patients. The present paper is a compilation of studies

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carried out on diabetic patients from year 2000 to 2014 and explores the BMI, nutrient consumption pattern and blood values (fasting and post prandial sugar level) of pre and post diet counseling. The main objective of the study is :

- To assess the impact of diet counseling on the blood values of diabetic patients.
- To assess the BMI of the study of the studied diabetic patients from year 2000 to 2014.
- To analyze the effect of dietary intervention on their nutrient intake.

## RESEARCH METHODOLOGY

All the studies were carried out in different years in Varanasi. All 298 diabetic sample were collected in OPD of endocrinology Department Sir Sunderlal Hospital Varanasi and 158 patients were community based. Sampling of the present study was done by purposive sampling technique with schedule. Nutritional assessment was done by applying standard techniques of anthropometry, biochemical parameters, dietary survey (24hour recall method). The information on food consumption pattern was collected through predesigned and pretested questionnaire method. Calorie and other nutrient were calculated by their daily diet intake by using standardized cups and food table given by I.C.M.R.. Patients of all the years were classified based on diet and drug intake.

## RESULTS AND DISCUSSION

The state of diabetic patients observed during the

consecutive years from 2000-2014. Analysis of data reveals that minimum percentage of underweight was in the year 2010 (11%), which gives a clear indication that the nutrient intake of that patients was comparatively lower. Similarly after observing the data, maximum percentage of normal patients were sample during year 2000 (54%) and data interpretation for the year 2010 of overweight patients gives valuable information of maximum patients (65%) in overweight category indicating that the patients were totally ignorant about dietary intake in their daily routine.

According to Ford *et al.* (2002), metabolic syndrome (MetS) and body mass index (BMI) are established independent risk factor in the development of diabetes.

Hadaegh *et al.* (2011), also reported that obesity increases diabetes risk in absence of metabolic syndrome, underscores the need for more stringent criteria to define healthy metabolic state among obese individuals.

The effect of diet counseling on the blood values of the sample of studies carried in different years (2000-2014). The significant change is observed in blood values of diabetic patients after diet counseling. In accordance with the patient finding Miller *et al.* (2002) observed that increase in total knowledge scores and greater decrease in fasting plasma glucose levels among diabetic patients after nutrition education.

Table 2 shows the effect of diet counseling on blood sugar level *i.e.* fasting and post prandial blood sugar level. The results of all the studies show that there is a significant change in blood values of the diabetic patients after diet counselling.

Srivastave *et al.* (1998) also conducted a study in

**Table 1 : State of diabetic patients during 2000-2014**

BMI	2000	2006	2010	2014
Under weight	41 (26%)	13(13%)	11(11%)	14(14%)
Normal	85(54%)	41(43%)	24(24%)	34(43%)
Over weight	32 (20%)	42(44%)	67 (65%)	52 (54%)
Total number of sample	158 (100%)	96(100%)	102 (100%)	100(100%)

**Table 2 : Diet counseling on the blood values of the sample of studies in (2000-2014)**

Blood values		2000	2006	2010	2014
Fasting blood sugar	Initial	155.17	163.1	133.82	178.24
	Follow up	108.82	139.3	81.47	112.82
Post prandial blood sugar	Initial	277.88	230.00	188.98	272.46
	Follow up	139.53	209.5	176.49	135.73

which intensive diabetic education on diet, drugs and exercise, complications and prevention was given to the patients for one month. A marked decrease in fasting blood sugar level, cholesterol and lipoprotein fractions was found.

After reviewing the result of the studies carried out in different years, a significant change is observed in intake of calorie, protein, carbohydrate and fat after diet counseling. Table 3 shows the distribution of sample according to effect of diet counseling on their nutrient intake. The change in nutrient intake was almost same in all the years. It is noticeable that the calorie intake among diabetic patients was very low.

Satman *et al.* (2002) according to studies it is claimed that the risk of type II diabetes may be higher if food consist plenty of calorie, fat and less complex carbohydrate. Consuming excessive fat and getting excessive calorie, obesity and less physical activity lead to atherosclerosis and results in increased cardio-vascular risk.

In Fig.1 interpretation of calorie consumption pattern of diabetic patients according to their respective BMI gives a retrospect that during the year 2000 to 2014

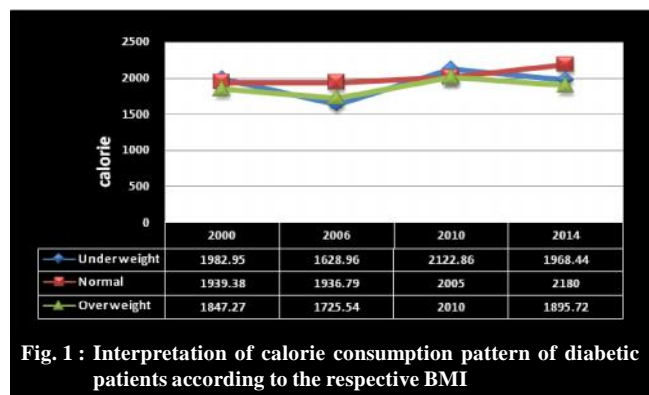


Fig. 1 : Interpretation of calorie consumption pattern of diabetic patients according to the respective BMI

after diet counseling a substantial decrease in nutrient intake was observed, similar pattern for underweight and overweight patients was observed, confirming a general trend but a deviation for normal BMI patient was observed for the same period of the study, with a remarkable increase in calorie consumption in 2014.

According to Tseng *et al.* (2005) and Abdul-Ghani *et al.* (2005), It is also known that obesity leads to an increase in complication risk and the amount of the drug used in treatment with the diabetic patients. That's why the weight control is very important for the diabetic patients while considering that 80 per cent of the diabetic patients of Type II are over their ideal weight, it is desirable that they reduce energy consumption.

In Fig. 2 the curve analysis of carbohydrate consumption pattern shows a similar and repeating trend across all BMI categories with maximum consumption level for year 2010 and minimum during year 2006.

Krik *et al.* (2008), concluded that, "A systematic review and meta analysis of controlled feeding studies in people with type II diabetes found that carbohydrate restricted diets (mean carbohydrate from 4% of total energy per day) improved A1C and triglycerides (TG),

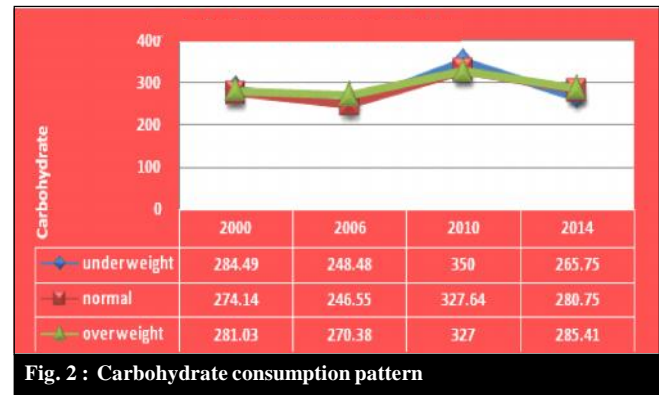


Fig. 2 : Carbohydrate consumption pattern

Table 3 : Effect diet counseling after change of nutrient intake					
Nutrient		2000	2006	2010	2014
Calorie (kcal)	Initial	1941.38	1510	2075.53	2219.33
	Follow up	1662.07	1400	1795.48	1810.24
Carbohydrate (g)	Initial	284.49	240.9	324.05	321.67
	Follow up	274.14	222.2	235.47	232.20
Protein (g)	Initial	64.48	37.6	91.27	86.49
	Follow up	62.93	44.2	59.03	57.18
Fat (g)	Initial	57.24	38.0	40.77	40.57
	Follow up	34.48	36.0	32.55	34.13

but not total cholesterol, HDL-C, LDL-C or body weight compared with higher carbohydrate diets over the short term. The long term sustainability and safety of these diets remain uncertain.

According to BMI, protein consumption pattern exhibit a respective curve with a trend reversal during the year 2006 to 2010 (Fig. 3).

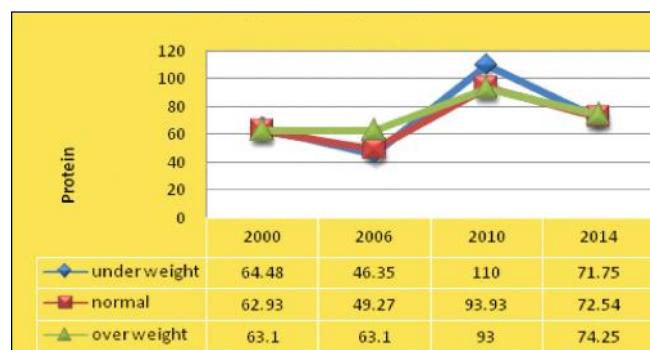


Fig. 3 : Protein consumption pattern

Hamdy *et al.* (2011) reported that there is no evidence that usual protein intake for most individuals (1 to 1.5 g per kg body weight per day), representing 15 per cent to 20 per cent of total energy intake needs to be modified for people with diabetes.

Fat consumption pattern Fig. 4 display a distinct deep steep inclination in fat consumption for year 2006 which is a uniform trend for all BMI categories.



Fig. 4 : Fat consumption for year 2006

According to King *et al.* (1995), it is likely that the south Asian people have BMI cutoff value lower than western. BMI might not correspond to the same body fat in different populations because of variation in body proportions, which can be the reason for lower BMI in Asians.

Baysal *et al.* (2008) concluded that one of the basic purposes of the nutritional treatment of the diabetic patients is to prevent the increase in triglyceride, total and LDL cholesterol that increase the cardio-vascular disease risk and the decrease in HDL cholesterol. For this reason, the patients should be careful in consuming the amount and the type of the fat. In under controlled diabetics, the level of plasma lipid is higher.

## Conclusion :

It can be concluded from all the studies there has been a significant change in the food intake of diabetic patients. Glucose level of patients has also changed due to effect of diet counseling and its significant relation with BMI. After the detailed study of all Table and Fig. it can be concluded that nutrient intake of overweight, normal and underweight diabetics was high before diet counseling and it considerably reduced after counseling. This may be due to intervention of diet counseling in nutrient intake consumption pattern.

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## Authors' affiliations :

N.K. AGRAWAL, Department, Endocrinology, Institute of Medical Sciences, Banaras Hindu University, VARANASI (U.P.) INDIA

ARCHANA CHAKRAVARTY, Department of Home Science (Food and Nutrition), Mahila Maha Vidhyalaya, Banaras Hindu University, VARANASI (U.P.) INDIA  
Email: archana.nutrition@gmail.com

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